A. M. D. G.

BULLETIN

of the

AMERICAN ASSOCIATION OF JESUIT SCIENTISTS

(Eastern Section)

(For Private Circulation)

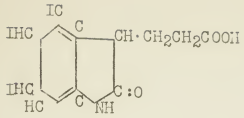
Vol. IV., No. 5, Weston, Mass. May-June, 1927, p. 45.

A SHORT REVIEW OF THE THYROXINE QUESTION.

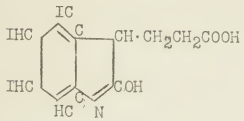
Although the relation of the thyroid gland to the metabolic rate of the animal organism has been known for some time, it was not until 1914 that the active principle of the gland was isolated by E.C.Kendall of the Mayo Clinic. This crystalline substance he called thyroxine, and he set to work at once to determine if possible its structure. His principal articles dealing with this matter are found in the Journal of Biological Chemistry 39, 125 (1919) and 40, 265 (1919), the first of which describes the methods of extracting the substance from the thyroid gland and the second of which gives details of crystalline form and the chemical evidence on which Kendall based his contention that thyroxine was

tri-iodo-trihydro-betaoxindole-propionic acid.

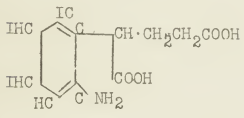
As regards isolating the substance, Kendall had obtained at the time of the first article in 1919 a total of 33 grams of thyroxine from a total of over 3 tons of fresh gland material, chiefly from the hog. He notes that there is an enormous difference in the thyroxine content of different batches of glands. The process is essentially an alkaline hydrolysis of the gland material to free it from the adhering fatty substances followed by successive solutions in alkali and precipitations with acid (even CO_2) all of which processes however were attended with numerous unforeseen difficulties which Kendall and his associates surmounted with remarkable ingenuity and patience. To determine the structure of thyroxine, Kendall relied almost entirely on indirect evidence, taking as his starting points a) the empirical formula $C_{11}H_{10}O_3NI_3$, and b) the fact that when strongly heated with concentrated NaOH solution the odor of indole is perceived and a pine-splinter moistened with HCl is turned red by the vapors given off from the fusion; this last test led to Kendall's conclusion that thyroxine contained an indole nucleus. On this basis he devised a structural formula in which the N was the N of the indole nucleus, and the non-carboxylic oxygen was ortho to it, as in oxindole, but in a highly labile condition, so that three possible forms of this thyroxine could exist, namely:-



the ordinary form



THo onol form



the open-ring form

The indirect evidence for this formula was all drawn from the combining ratios and iodine content of certain addition compounds, especially the sulphate, the hydrochloride, the uroide, and the acetyl compound; the composition and iodine content of these substances pointed to a molecular weight of 585, which is the theoretical molecular weight of the compound $C_{11}H_{10}O_3NI_3$. Kendall reports four determinations of the empirical composition for the elements carbon, hydrogen, and iodine, and one determination (method not stated) for nitrogen. He reports a nitrogen percentage of 1.66 as determined in the Van Slyke apparatus with nitrous acid. In 1925 Kendall made his work on thyroxine the subject of the Chandler lecture of that year, which he was invited to deliver at Columbia, and which is given in full in Ind. Eng. Chem. 17, 525 (1925). In this article he reports the synthesis of a large number of compounds of formula similar to his thyroxine formula; and here too he makes the statement, "The empirical formula for thyroxine is $C_{11}H_{10}O_3NI_3$. The evidence for the empirical and structural formula has been published elsewhere and it will suffice here to note that the work since 1919 has confirmed the structure of thyroxine assigned at that time in every particular, except the position of one of the double bonds." The compounds he believed to be related to thyroxine were all indole derivatives, and some had marked physiological activity in the way of an increase in amplitude and rate of respiration, increase in basal metabolic rate, increase in pulse rate, and fall of blood pressure. He did not however claim to have synthesized thyroxine itself; and the compound he described most nearly resembling it chemically,

beta (4,5,6, tribrom, 2 oxindole) propionic acid

did not resemble thyroxine at all. At all events, most chemists were satisfied that if the indole formula was good enough for Kendall, it was good enough for them, and only a few were prepared for the sensation which appeared in the (British) Biochemical Journal 20, 293 (1926) in the form of two articles by the comparatively obscure chemist C.R.Harington of Cambridge, England.

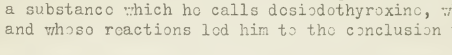
Seldom has the work of a distinguished chemist been handled so unceremoniously as was Kendall's structural formula, but even proved his empirical formula to be incorrect, giving thyroxine four atoms of iodine instead of three as the American chemist had it. With regard to Kendall's formula Harington says, "Contained in this formula are several inherent chemical improbabilities, if not impossibilities, but it is perhaps not necessary to enter into the question further here, since a careful study of Kendall's paper (J.B.C. 39, 125) reveals the very slender nature of the evidence from which the formula is deduced.

Indeed, it is justifiable to say that from a chemical point of view there is no evidence." He then points out that the pine-splinter test for indole means nothing under the circumstances, and that Kendall had not taken sufficient precautions in the combustion to insure the proper accuracy for his hydrogen figure. The empirical formula Harington obtained is $C_{15}H_{11}O_4NI_4$. The yield he obtained was 20 times as great as was Kendall's, but the physiological and chemical properties of the substance show that he was really working with the same thing as was Kendall, that is, the pure crystalline active principle of the thyroid gland. Before describing his experimental work Harington says, "In view of the self-evident identity of the substance prepared by the above method with Kendall's thyroxine, and the proof just mentioned that his proposed empirical formula is incorrect, no further reference will be made to his subsequent publications, and the work here reported is to be regarded as proceeding from this point onwards upon first principles." The secret of Harington's success lay in the fact that he succeeded in stripping thyroxine of its iodine atoms without any disturbance to the rest of the molecule; and this he did by a mild reduction with hydrogen using a solution of palladious chloride in which is suspended calcium carbonate. (cf. Busch & Steeve, Ber. 49, 1063 - 1916). By this treatment (whereby approximately four moles of hydrogen were taken up by the thyroxine) he obtained a substance which he calls desiodothyroxine, which has the empirical formula $C_{15}H_{15}O_4N$ and whose reactions led him to the conclusion that it had the formula of

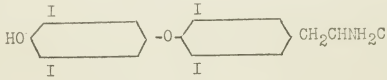
beta 4(4' hydroxyphenoxy) phenyl alpha amino propionic acid

or in other words, the para-hydroxyphenyl ether of tyrosine; and that thyroxine itself is the tetraiodo-substitution product of this compound. To confirm the structural formula of the desiodothyroxine (i.e., thyroxine stripped of its halogen)he started from the parent substance

4(4' methoxyphenoxy) benzaldehyde



and added on the amino-substituted side-chain by condensing the above substance with glycine anhydride, and also by condensing it with hydantoine. The substance resulting from both of these syntheses proved to be identical with the desiodothyroxine obtained from the natural thyroxine. It is worthy of note also that both of these most important syntheses were made on very small amounts of substance; the amount of the 4(4' methoxyphenoxy)benzaldehyde for the condensation with glycine anhydride being only 2.4 grams and the amount condensed with hydantoine only 4 grams. The whole investigation is a masterpiece of logic, organic chemistry, and technique. Harington has not as yet stated with any certainty what he believes to be the positions of the four iodine atoms, but is inclined to think that they are in the 3,5,3',5' positions, making the formula for thyroxine itself



The last scene of all that ends this strange and eventful history (at least for the present) was an article by Kendall which appeared in the Jour. Biol. Chem. for March of this year (J.B.C. 72, 213 - 1927). He ascribes the great difference in yield between his procedure and that of Harington to the differing thyroxine content of the thyroid material used, that originating in this country giving such extremely poor yields, even with Harington's own method, that Kendall estimates that to extract from this material the amount of thyroxine Harington had available (about 100 grams), it would take several years work and an expence of about $30,000.

Kendall next says, "The work of Harington has shown that thyroxine is not an indole derivative and one may ask what was the evidence upon which the formula suggested in 1919 was based." He then reviews briefly the evidence, which has been mentioned above, and closes the article with this remarkable sentence: "I congratulate Harington on bringing to a successful close the identification and synthesis of one of the most interesting substances known."

This whole controversy is one of the most interesting in recent chemical history, and several observations cannot but claim our attention. First, it rebounds greatly to the credit of both Harington and Kendall, the former for his skill in attacking and solving the problem, and the latter for his excellent pioneer work upon it and for his graceful yielding to the evidence against him. Second, from the stand-point of technique, it shows what care must be taken in running combustions on substances rich in halogen. Third, it illustrates how difficult it is to consider evidence against a hypothesis which one has developed; thus although Kendall could not get any significant amount of nitrogen out of indole or isatin via the Van Slyke reaction, this method yielded him 1.66% N from thyroxine itself; but his total nitrogen analysis and his general prepossession in favor of an indole nitrogen atom did not allow him to regard this large percentage of amino nitrogen as coming from an NH_2 group. (Harington does not report results of the Van Slyke reaction on thyroxine itself, but states that desiodothyroxine yields all its nitrogen by this method). Finally, it shows that if one can attack by superior evidence the generally accepted conclusions of even a very distinguished scientist, he will not be acting without an excellent precedent supplied by this controversy over thyroxine.

The reader will note that up to the present writing no one has claimed to have synthesized thyroxine itself; and of course until this has been done and the product checked by physiological tests, the question will not have been settled for good.

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THE CELLOIDIN METHOD.

In the histological technic course the modified celloidin method outlined here was found well adapted in obtaining the general results desired from the students. The method was taken, as given in Joffroy's "Anatomy of Woody Plants", and the modifications worked out by Mr. Malumphy of the Department of Biology Holy Cross College. Last year it was used only for botanical work, but this year it was tried also on the animal tissues, and gave good results.

The tissue is fixed in chrom - acetic acid for twenty four hours. It is essential to remove the air in order to obtain perfect infiltration. This may be done by a faucet pump. The tissue is passed through the following series of alcohols, 15%, 35%, 50%, 70%, 85%, 95%, and 100%, remaining in each percentage, twenty-four hours.

To prepare celloidin for embedding, it must be dried thoroughly, then dissolved in equal parts of ether and absolute methyl alcohol. A percentage series of celloidin are used 2%, 4%, 7%, 10%, 13%, 16%. These are made by dissolving in 100 cc of equal parts of ether and alcohol, 2 grams, 4 grams, 7 grams etc of celloidin.

The tissue is removed from the 100% alcohol and placed in a small wide mouth bottle, enough 2% celloidin being poured over the tissue to cover it. The bottle is then corked and the cork wired on. A piece of heavy copper wire is run around the neck of the bottle, two loops of ears being turned up opposite to each other. (This wire must not be able to move on the neck of the bottle). Next pass a piece of wire through the loops over the cork and twist its ends together. Then the bottle is placed in a constant temperature oven at 56° C for twenty-four hours. In removing from the oven the bottle must be allowed to cool, outside the oven, for 15 minutes. If cork is removed immediately, the celloidin being under pressure, will foam out, and the tissue becomes dry and worthless.

After this pour off the 2% solution and replace by the 4% solution, rewire the bottle and replace in oven for same length of time. This procedure is the same for the remaining percentages of colloidin. (All the percentages of colloidin, save the 2%, can be poured back into thier stock bottles for further use). After th tissue has been in 16% colloidin for twenty-four hours, it should be left outside the oven unstoppered for another twenty-four hours. By the consequent hardening of the colloidin, the tissue acquires a matrix. Remove with forceps the tissue and surrounding colloidin, placing in chloroform for several hours. After this it can be kept indefinitely in a solution of equal parts of 70% alcohol and glycerine.

Due to the placing in the oven, the vaporization of the ether and alcohol puts the colloidin under pressure, causing it to fill the smallest interstices of the tissue very thoroughly.

In sectioning, the sledge microtome is used. If the tissue is small, it is mounted on a small wooden block. Place a drop of 10% colloidin on the block orient the tissue in this drop, pour more 10% colloidin over the tissue, and drop in chloroform for ten minutes. Then clamp in microtome.

In cutting both tissue and knife should be well wet with 95% alcohol. Sections should be stained and cleared in syracuse watch glasses. The colloidin should not be removed from the sections since it forms an excellent means of maintaining structural relations, it is transparent, and does not stain to any appreciable degree. To prevent the 100% alcohol, used in clearing, from dissolving the colloidin, a few drops of chloroform should be added.

To one unfamiliar with the method it may seem a long and tedious one, it does require more time and effort than the parffin method but the results are excellent, and compensate for the effort. When followed carefully, sections of six microns are consistently cut.

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THE NASCENT STATE

An element was said to be in the "nascent state" when it was in a free state just liberated from a compound, i.e. it was in the atomic instead of the molecular state. As described in the latest edition (1925) of Newell's "College Comistry" "The free atom is in a more active chemical state, called the nascent state, because an atom of oxygen just liberated from a compound is ready, so to speak, to oxidize." The expression would seem to be, to say the least, in-accurate; and in later textbooks such as "General Inorganic Chemistry" by M.Cannon Sneed of the University of Minnesota (Ginn and Company 1926) and Kendall's revision of Smith's "Inorganic Chemistry" (the Century Company 1927). The expression is not used. For the sake of our readers who may not have the latter book the paragraph in which Kendall summarises his arguments against the existence of a "nascent state" is given hence.

"It is, in any case, time that the term, and the idea of "nascent oxygen" should be eliminated from the science. This material is al-together imaginary it has never been isolated or studied quantitatively. If it is an allotropic form of oxygen, it must have properties and a degree of activity that can be defined quantitatively. But this cannot be done because it has not always the same activity. Then if all oxidizing agents perform thier oxidizing by means of "nascent oxygen" it is curious that ozone oxidizes indigo instantly and easily, while hydrogen peroxide does not, also that chloric acid $HClO_3$ oxidizises hydrochloric acid rapidly while perchloric acid $HClO_4$ does not. If we mean that, when the free elements are not present and yet compounds containing them interact we must assume that the elements are in the nascent condition, then we should be consistant, and explain the action of sulphuric acid on sodium chloride as being due to nascent chlorine and nascent hydrogen. All double decompositions would demand the same mode of explaination.

Finally, since every oxidation is accompanied by a reduction, when we assume the presence of nascent oxygen, to be consistant we ought to assume the presence of nascent hydrogen also each such case involves a twin birth. The conception will not bear careful examination." He says further that "The logical explanation of such differences in behaviour is to be found in a study of oxidation-reduction reactions and the various energy changes which they involve". And he gives as an example the oxidation of isatin by hypochlorous acid HOCl according to the equation:

$$C_{16}N_{10}N_2O_2 + 2HOCl \rightarrow 2C_8H_5NO_2 + 2HCl + 20{,}400 \text{ cal.}$$

The oxidation of isatin by oxygen if it could be carried out directly would yield 1,800 calories of energy in the oxidation of indigo by hypochlorous acid the acid is first decomposed into hydrochloric acid and oxygen thus:

$$2HOCl \rightarrow 2HCl + O_2 + 18{,}600 \text{ cal.}$$

The oxygen liberated from the hypochlorous acid then oxidizes the indigo. He points that all the facts of the oxidation of isatin can be accounted for by the activity of the hypochlorous acid on account of its large store of free energy. Note that the total calories 20,400 of the first equation is the sum of the heat of decomposition of hypochlorous acid and of the heat of oxidation of indigo 18,600 plus 1,800. The full discussion will be found in Kendall-Smith's Inorganic Chemistry, pages 273, 432, 592.

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OURS AT THE SEISMOLOGICAL MEETING AT CAMBRIDGE MASS.

The second annual meeting of the Eastern Section of the Seismological Society of America took place at the Massachusetts Institute of Technology Cambridge Mass. on May 4th and 5th. Fr. J.B.Macelwane of St. Louis University, Chairman of the Section presided with tact and with evident satisfaction to all. A number of interesting papers were read. Fr. F.A.Tondorf of Georgetown University gave an account of some of the early earthquakes mentioned in history which was received with marked interest. He dwelt particularly upon the earthquakes mentioned in the bible. Fr. Joliat of St. Louis University gave an illustrated description of two new Seismographic Stations at his University. Fr. Repotti of St. Louis University presented an account of his studies of fast surface wave in the earthquake of June 26th 1924. There were three papers of interest by men who are not professional seismologists. Mr. J.R. Freeman of Providence R.I. a well known civil engineer spoke first of the need of seismograph data for the guidance of structural engineers. He seemed to think that the data furnished by the instruments in our observatories of little use to practical engineer. The latter one built on concrete piers anchored to solid rock whereas the engineer wishes data that will help him when he has to put structures on soft soil with bed rock many feet below. He thought there was a need for a simple inexpensive instrument which could be put in every fire station. He also spoke on data available as a basis for earthquake insurance. He dwelt in this connection on the San Francisco catastrophe and showed pictures of many high buildings since erected in the city with commendable courage and profiting as far as possible by the lessons taught by the disaster. Professor Spofford of the department of civil engineering at Tech also discussed the various types of structures best fitted to resist earthquakes. There were several papers on New England Earthquakes in the past and the prospects for the future. Thus Dr. Keith of the U.S.Geological Survey discussed the recent series of New England Earthquakes and professor Mather of Harvard spoke of some of the early earthquakes of this region mentioning particularly the period of great activity in the 18th century resulting in the quakes of 1727, 1744 and 1755.

He seemed to think that similar activity is quite possible in the future. Mr. Crosby discussed the various districts of Boston with reference to earthquake stability. At the election of officers Fr. Macelwane was again elected chairman. Frs Ahern and Brock of Weston and Mr. Tynan of Fordham also attended the meeting.

PUBLICATIONS

In the May number of Popular Astronomy Fr. J.McCabe has a biographical sketch of the late Fr. Riggs preceded by a full page portrait which serves as a frontis-piece. We learn from it that Fr. Riggs was born in Cincinnati in 1857 and entered the Society in 1875. His interest in astronomy was due in large measure to Fr. Hedrick one of his class mates in philosophy at Woodstock. He taught science and mathematics at St. Ignatius College Chicago during his regency and returned to Woodstock for theology where he was ordained by Cardinal Gibbons in 1890. After teaching mathematics and astronomy at the St. Louis scholasticate he spent a year at Georgetown working with Fr. Hagen. From 1896 until his death he was stationed at Creighton University Omaha, where he helped to build up the science department and the observatory. He was a frequent contributor to scientific journals and was frequently consulted by the press and by others upon matters of astronomical interest. For many years he furnished the maps and data for Eclipses and Occultations for Popular Astronomy. As an evidence of his versatility Fr. McCabe recalls an incident which was much commented upon at the time and is worth quoting again. The occasion was "When he made the sun give proof that the evidence brought against a certain man could not be true. The man was charged with placing an infernal machine (a dynamite bomb in a suit case) on the porch of one who was supposed to be his enemy, and two girls who were the sole witnesses testified that they saw the man on the porch about 3 o'clock P.M. The suitcase was placed on the porch between 2 and 3 o(clock. Now these girls had been at a church a mile away and while there they formed part of a group photograph. This photograph had a shadow upon its surface. The year was 1910, and the date May 22. From the shadow Fr. Riggs declared that the photograph had been snapped within a minute of twenty and one half minutes after three. On the anniversary of the picture another test photograph proved that Fr. Riggs had named the time within a quarter of a minute. The accused man was freed".

Fr. Riggs's two books "The Graphical Construction Of Eclipses and Occultations" and Harmonic Curves" have already been mentioned in these pages. The May number of Popular Astronomy also has his last article on the "Total Eclipse of the Moon 1927, June 14-15". In the same number the secretary of the American Association of Variable star Observers states, "Fr. E.C.Phillips of the Georgetown College Observatory contributes for the same time to our columns. It will be recalled that it was at this observatory that Fr. Hagen carried on much of his monumental work on variable stars and their comparison star sequences". He refers to observations made on variable stars by Fr. Phillips and not to articles he has contributed to this journal in the past.

Popular Astronomy for June-July has an article by Fr. Hagen on The VIIth Series of the Atlos Stellarum Variabilium", and an article with maps on the "Occultation of Saturn by the Moon 1927, July 10th" by Fr. E.C.Phillips and Mr. J.Blatchford.

The excellent "Revue des Questions Scientifiques" a quarterly published by the Societe Scientifique de Bruxelles and edited by Fr. H.Dopp (Prov. Belg.) of Louvain has always had a number of Jesuits among its contributors. The January number has a long note by Fr. Bosmans "Apropos de la Correspondance de Descartes avec Constatin Huygens" with reviews by Fr. Dopp, Bosmans, Fallon etc. The April number has a continuation of a long article by FR. Dopp on "L'Electricite Atmospherique". The complete article has recently been published as a separate brochure of which the author has kindly sentus a copy. It gives a good summary of our present knowledge of this subject. There is also a report of the "Etudes de geophysique au XIV Congres geologique international" by Fr. Noumann director of the seismological station at Cartuja in Granada.

Our readers will remember that Fr. Dopp attended our meeting at Georgetown last summer. Isis, the organ of the History of Science Society has an article in its February number by Fr. Bosmans (Prov. Belg.) on "Andre Tacquet S.J. et son Traite d'Arithmetique theorique et practique". He gives an account of his life and refers to his treatise "Des Cylindres et des Annoaux" and to his mathematical texts one of which the "Elements de Geometrie" was used in many schools until the end of the 18th century not only in the Netherlands but also in England. Tacquet corresponded with the famous Dutch physicist and mathematician Huyghens. Bosmans says that in 1660 Huyghens made a special journey to Antwerp to visit Tacquet. "The Jesuit was immediately captivated by the charm of his young visitor. Their cordial and confidential conversations ranged not only over mathematics and the sciences but also over philosophy and religion. Tacquet at the end was so impressed that he believed he had almost brought Huyghens to catholicism. But this was pure illusion".

Fr. Luis Rodes director of the Observatorio del Ebro who spent some time in our American provinces studying astronomy has recently published a work entitled "ElFirmamento, Exposicion Razonada Y Profusamente Illustrada de los Conocimientos Actuales sobre el Cosmos". The price is given as 64 pesetas or 10 dollars. It may be ordered from the Observatorio del Ebro Tortosa Spain.

The Wiley Bulletin for May 1927 in its California Supplement gives a view of O'Connor Hall at Santa Clara with a portrait of Fr. C.J.McCoy president of the University. Popular Mechanics for July has a short article on Fr. Ricard of Santa Clara with his portrait and his arrangement for drawing sun spots.

"Thomas Edward Murray, L.L.D. '18, An Appreciation" by Rev. F.A.Tondorf, Georgetown College Journal. May 1927.

RADIO TALKS BY FR. M.J.AHERN.

By invitation of Mr. W.E.Burton, the Superintendent of Broadcasting of station WEEI conducted by the Edison Illuminating Company of Boston, Fr. Ahern of Weston has been giving a series of six talks from that station on the general subject of "Science and Religious Belief". The talks are given on successive Friday evenings from 9.30 to 9.50 according to the following schedule:

May 20th, Historical Glimpses of the Contacts of Science and Theology.

May 27th, Astronomy and Religious Belief.

June 3rd, Geology and Religious Belief with Special Reference to the Bible.

June 10th, Biology and Religious Belief with a discussion of Evolution.

June 17th, Physics and Religious Belief.

June 20th, Chemistry and Religious Belief.

In all these talks not only is emphasis placed on correct philosophical and theological principles, but as many as possible of the great discoverers and workers in all these branches of sciences who were either Catholics or outspoken Christians are enumerated and their achievements described. Judging from the large number of favorable comments received, both orally and by letter, the talks are being listened to with profit by many thousands. At least two men have been so influenced that one of them is on the way to conversation to the church and the other to return to the practice of the faith which he had abandoned largely because of apparent difficulties from science.

We may add that in addition to his work at Weston Fr. Ahern has also been lecturing on Astronomy and Geology at Holy Cross. He has also lectured before various organizations during the year on the general subject of science and religion. We are indebted to Fr. Ahern for the following notes of interest.

RESEARCH AT PRINCETON UNIVERSITY

On May 10th corner-stones were laid of two new buildings at Princeton University, a chemistry building and an engineering building. Part of the celebration connected with this event was an exhibit of some of the results of chemical research carried on at the university. One of the most significant exhibits was of the apparatus used in the experiments of Dr. Hugh S. Taylor, Professor of Physical Chemistry at Princeton, and his associates, on the disintegration of molecules into atoms and the breaking up of more complex organic compounds into simpler ones by electrically excited mercury atoms. Essentially the apparatus consisted of two tubes one within the other. The inner one was of quartz glass, the outer one of Pyrex glass. The outer one was filled with mercury vapor under intense electrical excitation, while through the inner tube the various elementary gases or organic compounds in the vapor state were passed. The energy given out by the excited mercury vapor brought about the disintegration of the substances in the inner tube, the products being examined by spectroscopic means.

A Thermo- chemical check on the spectroscopic results was being devised. Very little has been published on these researches, but it is believed they will yield important clues to the properties of the molecular and atomic states of the elements.

Fr. Ahern was present at the celebration as a delegate of the Northeastern Section of the American Chemical Society, of Holy Cross College and of Boston

RECENT SCIENTIFIC HONORS TO SOME OF OURS

At the annual meeting in May of The Northeastern Section of the American Chemical Society, Father Strohaver was elected a Director of the Section, Father Hohman was re-elected Councillor, and Father Ahern was appointed to the Reception Committee for the convention of the American Chemical Society at Boston in September 1928. The latter was a member of the Nominating Committee of the Geological Society of Boston for the recent meeting of the Eastern Section of the Seismological Society of America.

AN ASTRONOMICAL SUPPLY HOUSE

The Eastern Science Supply Company P.O.Box 1414, Boston, Massachusetts specializes in equipment for the teaching of Astronomy. The company has devised and constructed some novel and excellent apparatus for which they have just issued a well illustrated catalog. Some of this apparatus will be shown during the science convention this summer. Meanwhile those interested should send for the catalog.

QUOTATIONS

1. In his new (1927) "Elementary Physical Chemistry" Dr. Hugh S.Taylor has put on the page following the titlepage the following:

"It is also time that men seek more of their origin; for their origin is a part of them and indeed the most important part of them. Thus they become more extraordinary by being explained. He has more wonder at them but less fear of them; for a thing is really wonderful when it is significant and not when it is insignificant". G.K.Chesterton--"St. Francis of Assisi".

2. In an address entitled "Creative Co-ordination" delivered on June 3rd at the University of Chicago, Dr.Michael I.Pupin of Columbia University said:

"The only thing that science can say to-day is that God created life -- Science has so informed the mental attitude of men that to-day instead of being atheists and agnostics we must believe in God".

"Our souls" he added, "have the power of creating. Since my soul can create why cannot we believe in a Supreme Creator?"

Fr. M.J.Ahern,S.J.
Fairview,
Weston, Mass

The Science Summer School will be held at Holy Cross College, Worcester, Mass.

The Eastern Section of the Jesuit Scientific Association will hold its annual meeting at the new Scholasticate, Fairview, Weston, Mass., on August 12 and 13.

ADD DUM TO PUBLICATIONS.

The Scientific American for July gives a picture of Fr. Ghorzi (Prov. of France) of the Zi-Ka Woi Observatory standing besides his Wiechert Seismograph with a China man who is probably one of his assistants. The descriptive notice states the "The Jesuits incline rather strongly to Science, especially earthquake science."